



## Features

- AEC-Q200 qualified
- ESD protection to IEC 61000-4-2 Level 4
- <1 ns response time to ESD strike
- Low leakage current
- Extremely low capacitance (0.2 pF typ.)
- Bidirectional device
- Multi-strike capability

 Model CG0603MLC-05E and CG0603MLC-12E are currently available, but not recommended for new designs. Substitute Model CGA0603MLC-05E and CGA0603MLC-12E.

## CG0603MLC-05E & -12E - ChipGuard® ESD Protectors

### General Information

The Bourns® ChipGuard® Automotive MLC Series is a sub-1 pF protector designed specifically for use in automotive circuits requiring ESD protection. In addition to its very low capacitance, this protector exhibits extremely fast response times to ESD events, making it ideal for protecting a wide array of high speed digital electronic applications.

The ChipGuard® Automotive MLC Series is fully AEC-Q200 qualified and supported.



### Electrical Characteristics @ 25 °C (unless otherwise noted)

Parameter	Symbol	CG0603MLC-05E	CG0603MLC-12E	Unit
DC Working Voltage	$V_W(DC)$	$\leq 5$	$\leq 12$	V
Maximum Leakage Current @ Max. $V_W(DC)$	$I_L$	<0.01		$\mu A$
Typical Clamping Voltage (Note 1)	$V_C$	30		V
Typical Trigger Voltage (Note 1)	$V_T$	300		V
Typical Peak Voltage (Note 2)	$V_P$	300		V
Typical Capacitance @ 1 MHz, 1 Vrms	$C_O$	0.2		pF
Response Time	$R_T$	<1		ns
ESD Protection: Per IEC 61000-4-2 Level 4 Min. Contact Discharge Min. Air Discharge Typical ESD Withstand		$\pm 8$ $\pm 15$ (Note 3) 1000		kV kV Pulses
Operating Temperature	$T_{OPR}$	-55 to +125		°C
Storage Temperature	$T_{STG}$	-55 to +125		°C

- Notes: 1.  $V_T$  and  $V_C$  measured using TLP (Transmission Line Pulse) method.  
 2. Peak voltage measured under ESD Test Conditions: IEC61000-4-2, 8 kV contact discharge.  
 3. IEC 61000-4-2 ESD Performance will meet minimum 1000 reps without degradation in performance.



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\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.  
 Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

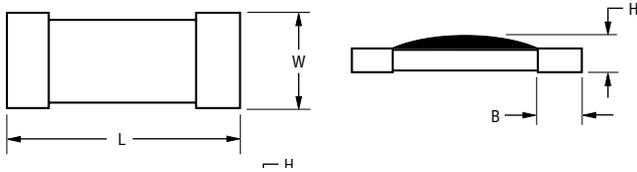
## Applications

- Camera links
- Sensors
- Touchscreen interfaces
- GPS
- Antennas
- USB 3.0
- High-speed communications buses

## CG0603MLC-05E & -12E - ChipGuard® ESD Protectors

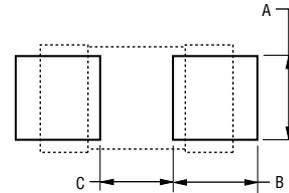
**BOURNS®**

### Product Dimensions



Dim.	CG0603MLC Series
L	$\frac{1.60 \pm 0.10}{(0.064 \pm 0.004)}$
W	$\frac{0.85 \pm 0.15}{(0.033 \pm 0.006)}$
H	$\frac{0.51 \pm 0.05}{(0.020 \pm 0.002)}$
B	$\frac{0.30 \pm 0.20}{(0.012 \pm 0.008)}$

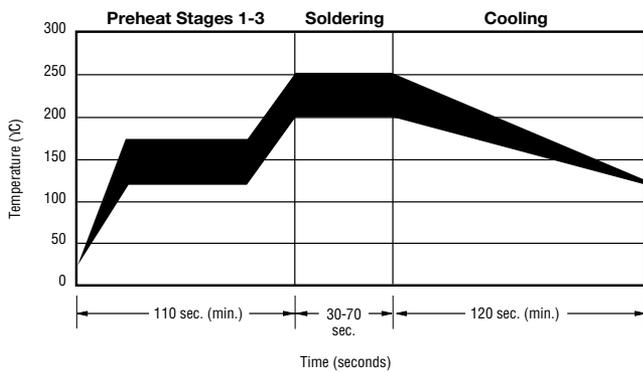
### Recommended Pad Layout



Dim.	CG0603MLC Series
A	$\frac{0.75 \pm 0.1}{(0.03 \pm 0.004)}$
B	$\frac{0.75 \pm 0.1}{(0.03 \pm 0.004)}$
C	$\frac{0.75 \pm 0.1}{(0.03 \pm 0.004)}$

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

### Solder Reflow Recommendations



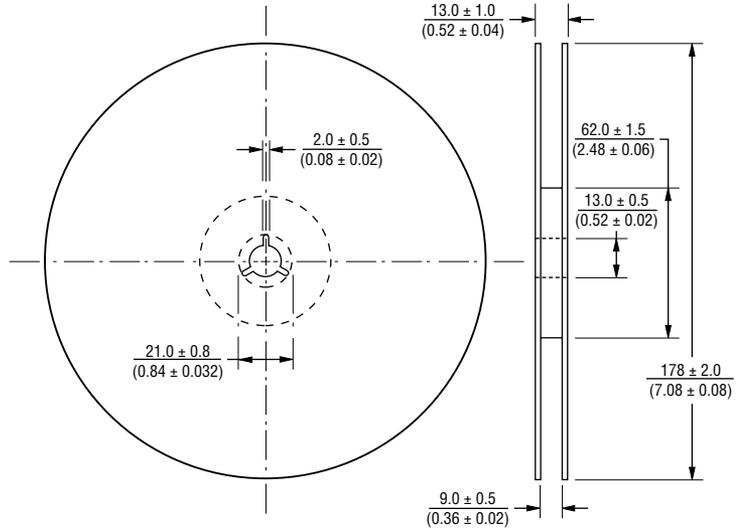
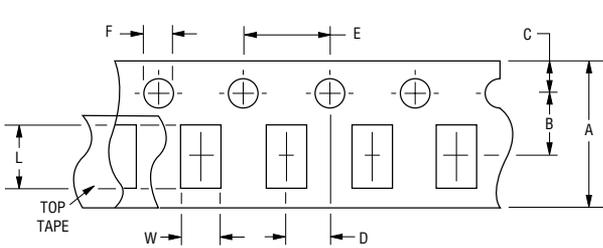
A	Stage 1 Preheat	Ambient to Preheating Temperature	30 s to 60 s
B	Stage 2 Preheat	140 °C to 160 °C	60 s to 120 s
C	Stage 3 Preheat	Preheat to 200 °C	20 s to 40 s
D	Main Heating	200 °C 210 °C 220 °C 230 °C 240 °C 250 °C to 255 °C	60 s to 70 s 55 s to 65 s 50 s to 60 s 40 s to 50 s 30 s to 40 s 5 s
E	Cooling	200 °C to 100 °C	1 °C/s to 4 °C/s

- This product can be damaged by rapid heating, cooling or localized heating.
- Heat shocks should be avoided. Preheating and gradual cooling recommended.
- Excessive solder can damage the device. Print solder thickness of 150 to 200 um recommended.
- Solder gun tip temperature should be kept below 280 °C and should not touch the device directly. Contact should be less than 3 seconds. A solder gun under 30 watts is recommended.

# CG0603MLC-05E & -12E - ChipGuard® ESD Protectors

# BOURNS®

## Packaging Dimensions



NOTES: TAPE MATERIAL IS PAPER.  
 TAPE THICKNESS IS:  $\frac{0.6 \pm 0.03}{(0.024 \pm 0.0012)}$   
 COVER TAPE ADHESION IS 35 ± 25 GRAMS.

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

Dimension	CG0603MLC Series
A	$\frac{8.00 \pm 0.30}{(0.315 \pm 0.012)}$
B	$\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$
C	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$
D	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$
E	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$
F	$\frac{1.50 \pm 0.10}{(0.059 \pm 0.004)}$
L	$\frac{2.02 \pm 0.20}{(0.080 \pm 0.008)}$
W	$\frac{1.27 \pm 0.15}{(0.050 \pm 0.006)}$
T	$\frac{0.60 \pm 0.03}{(0.024 \pm 0.0012)}$

## How to Order

### CG 0603 MLC - nn E

ChipGuard®  
 Product Designator  
 Package Option  
 0603 = 0603 Package  
 Multilayer Series Designator  
 Maximum DC Working Voltage  
 05 = 5 V  
 12 = 12 V  
 Tape & Reel Packaging  
 E = 5,000 pcs. per reel

REV. A 01/17

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